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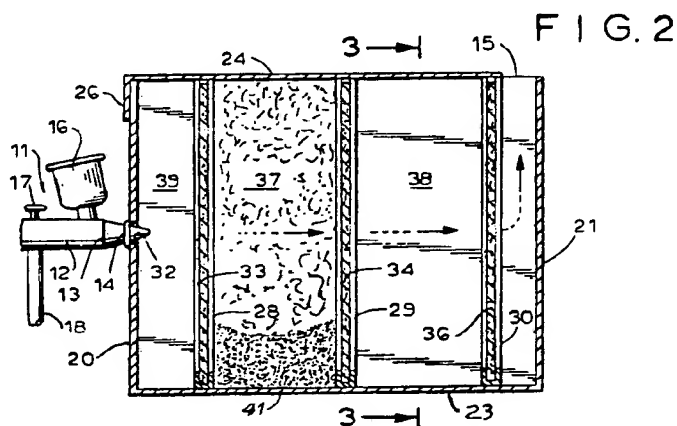
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(54) **Cleaning air brushes**

(57) A device for minimizing air pollution when cleaning an air brush comprises a box having a centrally located front opening 32 for seating the air brush spray tip 13 and a rear exhaust opening 15. The top wall 24 opens to permit replacement of rectangular filters 33, 34 and 36 which locate in channels 28, 29 and 30. The filters are of successively finer porosity and delineate between them successive diffusion and particulate matter precipitating chambers 37 and 38. The air brush tip 13 is seated in the inlet opening 32 and actuated with a cleaning fluid which removes particulate residue from the air brush and deposits it on the walls of the successive chambers and on the filters. Material 41 absorbs liquid in chamber 37.



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FIG. 1

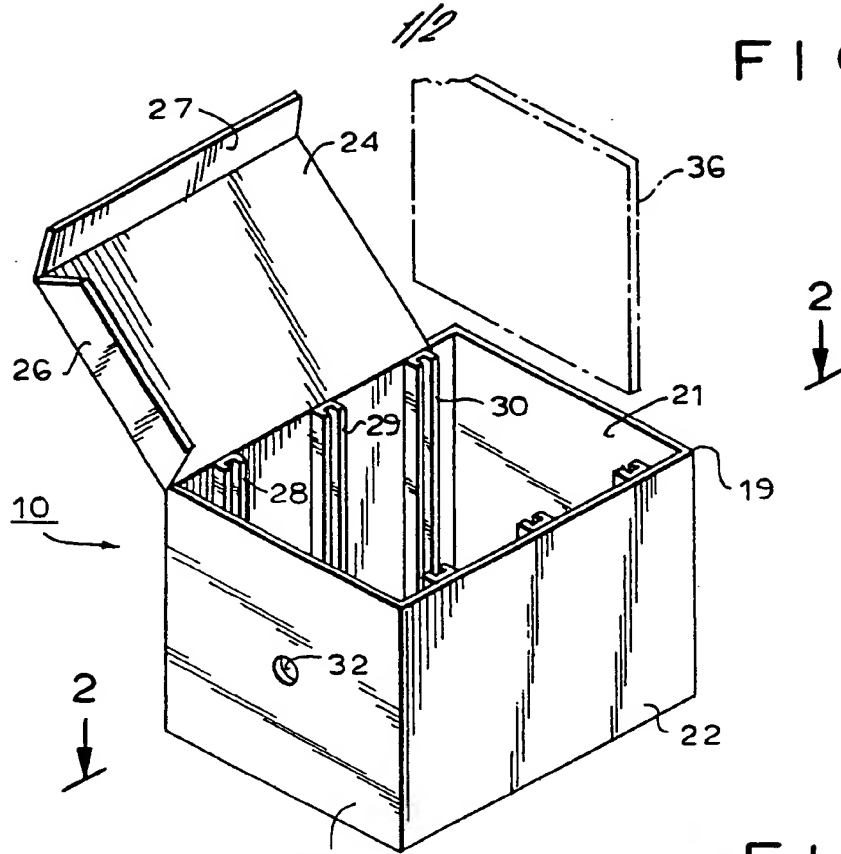


FIG. 2

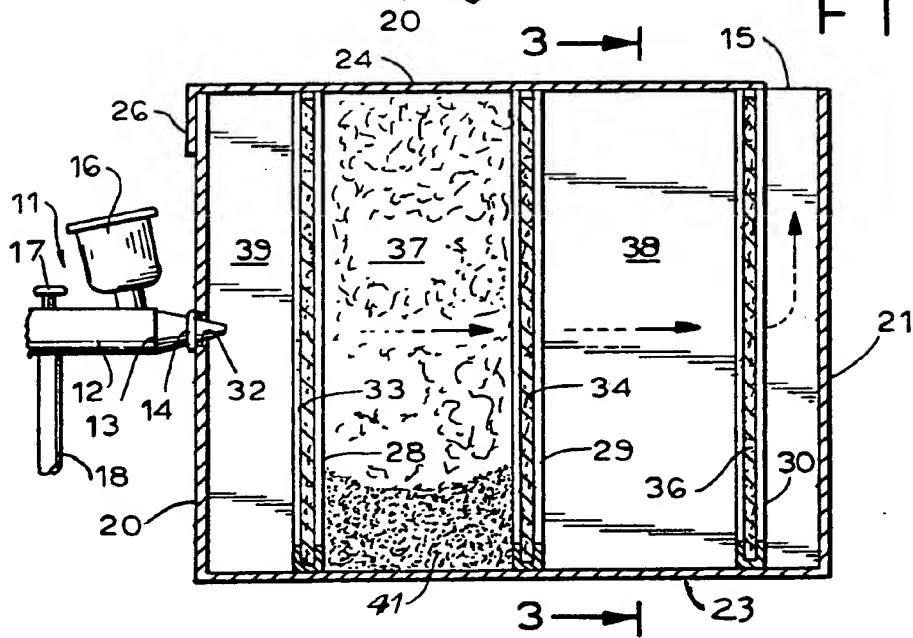


FIG. 3

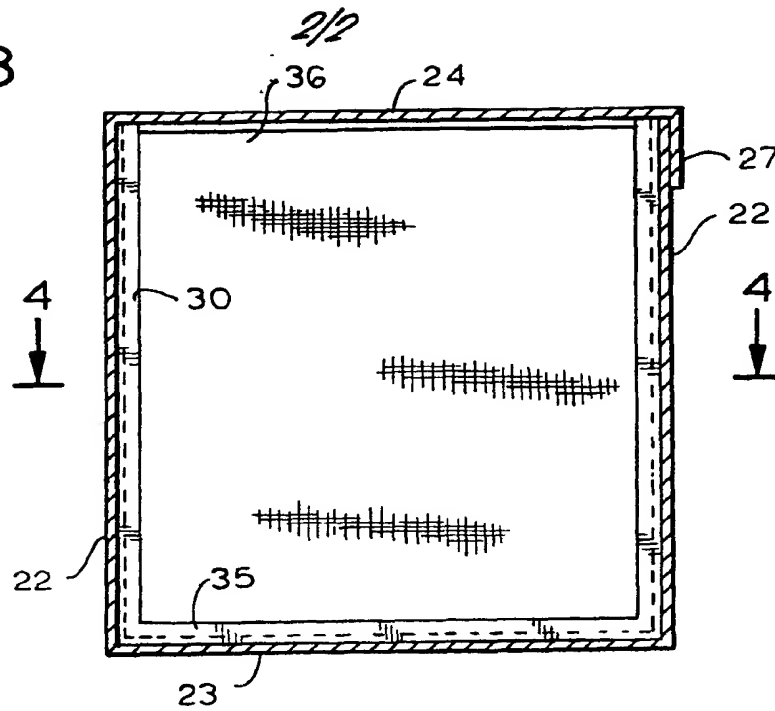
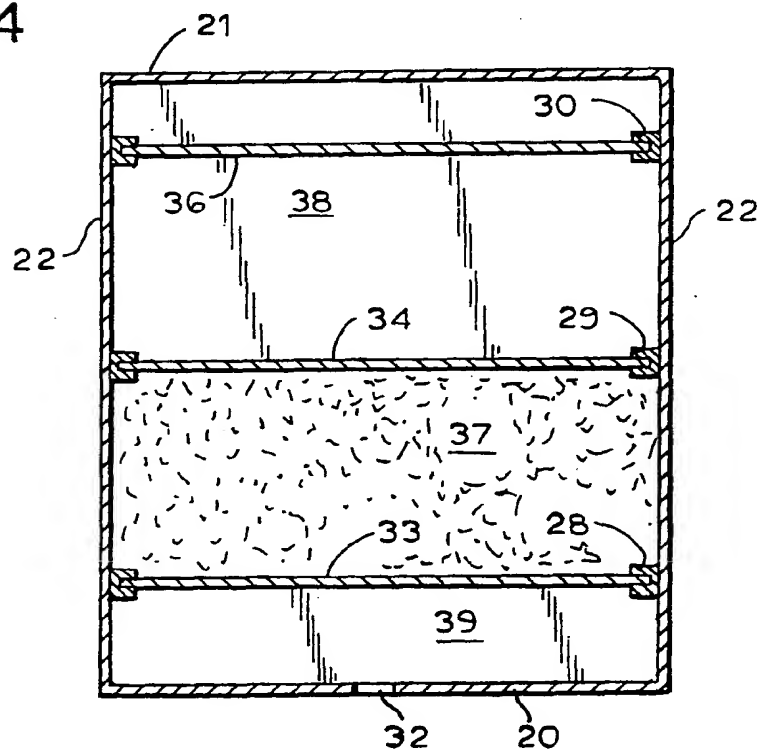


FIG. 4



CLEANING AIR BRUSHES

5 The present invention relates to minimizing the pollution to the ambient atmosphere attendant to the cleaning of air brushes.

Air brushes, including spray guns and similar tools, are widely used in many applications, for example, by photographers and artists for applying shading and colour to drawings, prints and
10 photographs to accentuate highlights and for other purposes. Air brushes utilise compressed air to break up or atomise a pigment-carrying liquid which is drawn into a thin stream and directed as a fine spray from a needle valve controlled spray nozzle or
15 tip. The pigmented-liquid-traversed passageways and components of the air brush require frequent cleaning to prevent and remove any pigment and binder which may deposit on these components, and this is commonly achieved by spraying a cleaning liquid such as water,
20 an aqueous cleaning solution or an organic solvent, depending on the ink or paint vehicle employed. This cleaning procedure is generally performed with the changing of the colours being used or before any appreciable interruption in the use of the air brush,
25 particularly before an extended dormant period. The cleaning spray is generally released into the ambient atmosphere thereby polluting the atmosphere with particulate pigment and in many cases with other contaminants which may be carcinogenic and toxic and
30 in any case highly undesirable and frequently hazardous.

An object of the present invention is to minimize the pollution of the ambient atmosphere attendant to the cleaning of an air brush by the
35 spraying of a cleaning solution therethrough.

The present invention is employed with

conventional air brushes including spray guns and the like in which a liquid vehicle carrying a pigment or other colouring substance in fine particulate form is controllably sprayed as a confined high velocity mist of low divergence, the air brush being cleaned between different colour applications by substituting a cleaning fluid for the sprayed ink or paint to remove any deposits or remnants of particulate material in the air brush reservoir, passageways and nozzle.

In one aspect the invention provides a filter apparatus for use in cleaning an air brush, the apparatus comprising a chamber having an inlet opening for reception of the nozzle of an air brush, an exhaust opening and at least one porous filter disposed in the path between the inlet and exhaust openings.

In another aspect, the invention provides a method of cleaning an air brush in which a cleaning fluid is fed under pressure through the air brush to a spray nozzle at the tip of the brush and projected under the influence of the pressure as a spray, wherein the method comprises applying the air brush tip into engagement with an inlet opening in the front of a chamber having a rear exhaust opening while retaining the air brush substantially externally of the chamber, the chamber having a porous first filter between the openings and a diffusion compartment between the filter and exhaust opening, and actuating the air brush to feed the cleaning fluid through the air brush to pick up residue along the passage of the fluid through the air brush to and through the nozzle and project the spray of the residue-carrying cleaning fluid produced by the air brush spray nozzle under the influence of the pressure onto the filter whereby the fluid

traverses the filter and diffuses in the leading compartment to deposit residue on the walls of the compartment.

5 With the present invention an airbrush can be reliably and efficiently cleaned in the conventional manner even in small confined areas with a minimum or no significant pollution of the ambient atmosphere.

10 An embodiment of the invention will now be described by way of example and with reference to the accompanying drawings, of which:

Figure 1 is a perspective view of a device shown in open condition with the absence of the filter members;

15 Figure 2 is a medial longitudinal sectional view thereof taken along lines 2-2 in Figure 1, with the filter members in place and the device in closed operative condition, an air brush being shown in co-operative association with the device;

20 Figure 3 is a sectional view taken along line 3-3 in Figure 2; and

Figure 4 is a sectional view taken along line 4-4 in Figure 3.

25 Referring now to the drawings, a device 10 is shown applied to an air brush 11. The air brush 11 is of conventional construction and includes a hand-held cylindrical body 12 terminating at its front end in a conically shaped spray tip or nozzle 13 having a peripheral ridge 14 midway along its length. A small cup reservoir 16 is located on the
30 body 12 and axially communicates with the nozzle 13 by way of a needle valve which is finger controlled by a button lever 17 which likewise controls the feed of compressed air which is delivered to the air brush by a flexible hose 18 connected to a pressurized gas
35 source.

The device 10 comprises a chamber-defining box

19 which is formed of cardboard, fibreboard, plastics, metal or other suitable material and includes rectangular front and rear walls 20 and 21 respectively, rectangular side walls 22 and a rectangular base wall 23. A rectangular cover 24 is suitably hinged, for example, by a live or self hinge to the upper edge of one side wall 22 and extends from the front wall 20 towards, but stops short of, the rear wall 21. When the cover 24 is in its closed position overlying and engaging the top opening of the box 19 as shown in Figure 2, the transverse rear edge of the cover 24 is spaced from the top edge of the rear wall 21 to delineate therewith a rectangular exhaust opening 15 extending for the width of the box 19. Depending from the front and side edges of the cover 24 are flaps or flanges 26 and 27 respectively which, in the closed condition of the cover 24, releasably engage the upper borders of the front wall 20 and the side wall 22 opposite to the side wall 22 to which cover is hinged. The cover 24 need not be hinged to a side wall 22 but may be hinged to the front or rear wall or may be in the form of a flanged lid capping the box 19 except for the rear portion.

Suitably affixed to the inside faces of the opposed side walls 22 are three pairs of transversely aligned front, intermediate and rear vertical filter retainer channels 28, 29 and 30 respectively. The channel pairs 28 and 30 are spaced relatively short distances from the front and rear walls 20 and 21 respectively and the channel pair 29 is substantially midway between the channel pairs 28 and 30. The bottoms of the channels 28, 29 and 30 in each pair thereof are connected by a respective transverse channel 35 on the base wall 23. A circular inlet opening 32 is centrally formed in the front wall 20 and is dimensioned, for example between 6.35 and

19.05mm (1/4 and 3/4 inch) diameter, to separably receive in substantially close engagement therewith or to seat the air brush nozzle or tip 13 or a portion thereof to substantially close or greatly restrict the opening 32.

5 A rectangular first relatively coarse, self-sustaining filter 33, equal in height to the front and rear walls 20 and 21, has its side borders located in vertically slidably, separable, engagement
10 with the opposing front channels 28 and extends from the channel 35 on the base wall to the closed cover 24. A similarly shaped, second filter 34 of finer porosity than the first filter 33 is vertically releasably supported by and between the channels 29
15 and a still finer porosity filter 36, similar in shape to the filters 33 and 34, is vertically releasably supported by and between the channels 30. The filters 33, 34 and 36 delineate with the box walls successive successive relatively large
20 compartments 37 and 38 respectively; the front wall 20 and the filter 33 delineating a relatively narrow inlet compartment 39, and the rear wall 21 and the filter 36 delineating a relatively narrow outlet compartment which, in the closed position of the
25 cover 24, exhausts to the exterior through the exhaust opening 15. Absorbent material 41 is positioned along the base wall 23 between the filters 33 and 34 to hold any liquid trapped in the compartment 37. The filters 33, 34 and 36 may be
30 replaced by opening the cover 24 as shown in Figure 1, to provide access to the box interior and permit the upward slidable separation of the filters from the respective channel pairs and their corresponding insertion.

35 The filters 33, 34 and 36 are formed of hydrophobic materials preferably resistant to organic

solvents, such as fibreglass, polyurethane, polyester, nylon, polyolefin and the like and may be formed of fibres or filaments or may be of porous reticulated structure. The material 41 is a removable liner so that it can be easily replaced.

The device 10 is applied to the cleaning of the air brush 11, which is performed in the usual manner shortly after use by first emptying the reservoir 16 and filling it with a cleaning fluid, whose composition depends on the composition of the ink or paint employed with the air brush. The cleaning fluid may, for example, be water, water and dissolved cleaning agent or an organic solvent. The loaded air brush is held with its spray nozzle or tip 13 engaging and the ridge 14 preferably substantially closing the inlet opening 32. Button 17 is manipulated to open the air valve and liquid needle valve whereby to produce a spray which is projected through the inlet compartment 29 towards and through the first filter 33 which diffuses and passes the diffused particulate material suspending mist into the first compartment 37. The mist expands in the first compartment to deposit particulate material or pigment on the faces of the first compartment. Any liquid that forms in the first compartment 37 is absorbed by the material 41. The mist, carrying any residual finer particulate material travels under pressure through the second filter 34 which captures some of the particulate material, some of the remaining particulate material depositing on the faces of the second compartment 38. The particulate-matter-impooverished mist then traverses the third filter 36, where any remaining particulate material is removed and travels through the end compartment and the exhaust opening 15 into the ambient atmosphere. Some of the advancing particular

material deposits on filters 33, 34, and 36.

An experiment was carried out employing a box
19 approximately 17.8cm (seven inches) long, 10.2cms
(four inches) high and 12.7cm (five inches) wide and
5 filters 33, 34 and 36 approximately 6.35mm (1/4 inch)
thick and of succesively finer porosity from the
front to the rear. The device 10 in no way
interfered with the normal cleaning of the air brush
and removed about 90% of the particulate material
10 emerging from the air brush. The filters may, if
necessary, be periodically cleaned in an aqueous
detergent or a suitable solvent.

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CLAIMS:

- 5 1. A filter apparatus for use in cleaning
 an air brush, the apparatus comprising a chamber
 having an inlet opening for reception of the nozzle
 of an air brush, an exhaust opening and at least one
 porous filter disposed in the path between the inlet
 and exhaust openings.
- 10 2. Apparatus as claimed in claim 1, wherein
 the apparatus includes a plurality of replaceable
 filters which are longitudinally spaced from one
 another along the path and extend transversely across
 the chamber delineating with the walls of the chamber
15 successive compartments.
3. Apparatus as claimed in claim 1 or 2,
 wherein the apparatus includes two filters, the one
 nearer the exhaust opening being finer than the one
20 nearer the inlet opening.
4. Apparatus as claimed in any preceding
 claim, wherein a lid or door provides access to the
 interior of the chamber.
- 25 5. Apparatus as claimed in any preceding
 claim, wherein the chamber includes absorbent
 material.
- 30 6. A filter apparatus for use in cleaning
 an air brush substantially as herein described with
 reference to and as shown in the accompanying
 drawings.
- 35 7. A method of cleaning an air brush in
 which a cleaning fluid is fed under pressure through

the air brush to a spray nozzle at the tip of the brush and projected under the influence of the pressure as a spray, wherein the method comprises applying the air brush tip into engagement with an inlet opening in the front of a chamber having a rear exhaust opening while retaining the air brush substantially externally of the chamber, the chamber having a porous first filter between the openings and a diffusion compartment between the filter and exhaust opening, and actuating the air brush to feed the cleaning fluid through the air brush to pick up residue along the passage of the fluid through the air brush to and through the nozzle and project the spray of the residue-carrying cleaning fluid produced by the air brush spray nozzle under the influence of the pressure onto the filter whereby the fluid traverses the filter and diffuses in the leading compartment to deposit residue on the walls of the compartment.

8. A method as claimed in claim 7, wherein a gas under pressure is fed through the air brush and is admixed with and pressurizes the cleaning fluid and the residue-impooverished-gas exhausts from the chamber through the exhaust opening.

9. A method as claimed in claim 7 or 8, wherein a plurality of longitudinally spaced transversely extending filters are traversed by the spray and the residue entrained therein is deposited on the walls of compartments delineated between successive filters.

10. A method as claimed in claim 7, 8 or 9 wherein some of the residue is deposited on the filters.